

Final Report of the
**Executive Oversight Committee on the Implementation of a Statewide
Communications System for Maryland**

BEYOND 800

The Next Generation Wireless Communications System



Prepared By:

**Department of Budget and Management
Office of Information Technology
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As Requested by the

**Report of the Chairmen of the
Senate Budget and Taxation Committee
And
House Appropriations Committee**

1999 Session

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EXECUTIVE SUMMARY

Language in the 1999 Joint Chairmen's Report required the Secretary of the Department of Budget and Management to appoint an Executive Oversight Committee to create a plan to implement the technical and financial processes necessary to develop and fund a statewide 800 MHz wireless communications system. The Oversight Committee just recently completed its work and is submitting this document as its final report.

The first question the Oversight Committee addressed was, "Would it be financially advantageous for the State to move forward and build a system when it is known that 48 frequencies is not adequate for a statewide communications system? It was decided no. Many local jurisdictions and a few State agencies have funds or contracts in place to make immediate use of the granted frequencies. It was determined that these organizations should be given the opportunity to build or improve their systems with the distribution of these frequencies, while the State focuses on building the infrastructure and addressing the interoperability issues that present current obstacles in building a statewide communications system. Under this scenario, when new technology becomes available, 700 MHz frequencies or other, the infrastructure for a statewide system will be in place.

The Oversight Committee has adopted a solid framework for Maryland's next generation wireless communications system. The plan focuses on moving forward incrementally over the next 10 years to build the infrastructure required for a statewide system, address interoperability problems, and make use of alternative wireless communications where appropriate. Specific projects have been identified for funding in fiscal years 2000 and 2001. Based upon speculated State and local needs, other projects have been identified for fiscal 2002 and 2003. A coordinating body comprised of representatives from state and local government will assist in identifying, coordinating, and prioritizing future projects to meet the needs of the state and local jurisdictions. It has been recommended that interoperability guidelines be established for statewide operations and a pilot project be implemented in St. Mary's County to test how its system will communicate with surrounding systems. Alternative Wireless Communications pilots have also been recommended to explore the impact of Voice Administrative Communications and Remote Data Communications.

As the Oversight Committee formulated its plan, it did so incorporating standards and policies from the Information Technology Board as well as those developed by the Task Force on High Speed Network Development. This coordination must continue as Maryland moves forward with the statewide system. Maryland's high speed network will prove to be a crucial component of a statewide communications system in that it will provide inter-connections between tower sites and offer minimal levels of emergency redundancy where feasible.

Now that the final report has been submitted, the Oversight Committee has completed its work and will be merged with the Task Force on Public Safety Technology. A subcommittee of this group will continue to oversee Maryland's implementation of a statewide communications system and ensure the plan is being carried out with the Oversight Committee's wishes. This group will have broad representation from State and local jurisdictions. Working together in this forum, Maryland will successfully provide the highest quality safety communications service to the citizens of Maryland.

BACKGROUND

Language in the 1999 Joint Chairmen's Report required the Secretary of the Department of Budget and Management (DBM) to appoint an Executive Oversight Committee to create a plan to implement the technical and financial processes necessary to develop and fund a statewide 800 MHz wireless communication system. This language was included as the result of legislation that would have established a task force to study a statewide 800 MHz communications system out of urgency, since the State was at risk of losing its forty-eight 800 MHz frequencies. Both the General Assembly and the Administration are committed to providing the citizens of Maryland with the highest quality public safety services possible by providing public safety personnel with the latest tools and technology necessary to perform their duties.

In addition to providing a plan, the Executive Oversight Committee is also responsible for providing a final report on the status of the plan on December 1, 1999. An extension of the submission date to December 30, 1999 was requested and agreed upon by the budget committees. This report is in response to the final status report.

EXECUTIVE OVERSIGHT COMMITTEE

The Executive Oversight Committee is comprised of 22 members representing State agencies; urban, suburban, and rural areas; and professional and volunteer fire rescue personnel. A listing of the membership is attached (Attachment I). In addition, representatives from local jurisdictions that currently have 800 MHz systems in place were invited to attend. Their input has proved invaluable in shaping Maryland's statewide communications plan.

The Committee has adopted a solid framework for Maryland's next generation wireless communications system. The plan focuses on moving forward incrementally over the next 10 years to build the infrastructure required for a statewide system, address interoperability problems, and make use of alternative wireless communications where appropriate. Specific projects have been identified for funding in fiscal years 2000 and 2001. Based upon speculated State and local needs, other projects have been identified for fiscal 2002 and 2003. A coordinating body comprised of representatives from state and local government will assist in identifying, coordinating, and prioritizing future projects to meet the needs of the state and local jurisdictions.

Now that the final report has been submitted, the Oversight Committee has completed its work and will be merged with the Task Force on Public Safety Technology. A subcommittee of this group will continue to oversee Maryland's implementation of a statewide communications system and ensure the plan is being carried out with the Oversight Committee's wishes. The transition into the Task Force on Public Safety Technology and subcommittee structure will be discussed later in this report.

COMMITTEE FINDINGS

It became apparent at the first meeting that the State does not have enough frequencies to build a statewide communications system. The original request to the FCC was for 96 frequencies. Only 48 were granted. The Oversight Committee, therefore, was faced with answering the following question: Would it be financially advantageous for the State to move forward and build an imperfect statewide system? It was decided that this was not the correct approach. Many local jurisdictions and a few State agencies have funds or contracts in place to make immediate use of the granted frequencies. It was determined that these organizations should be given the opportunity to build or improve their systems with the distribution of these frequencies, while the State focuses on building the infrastructure and addressing the interoperability issues that present current obstacles in building a statewide communications system. Under this scenario, when new technology becomes available, 700 MHz frequencies or other, the infrastructure for a statewide system will be in place.

BEYOND 800 – THE PLAN

The Oversight Committee adopted the following statewide communications plan:

- Retain 10 frequencies for use by UMCP and BWI Airport to build their respective 800 MHz systems;
- Attempt to maintain the usage of the additional 38 frequencies by reallocating them to local jurisdictions within Maryland that have current requests before Region 20 (Region 20 was established by the FCC to act on its behalf for reviewing and recommending approval of spectrum requests);
- Give organizations within the State and local jurisdictions that have resources to build or improve systems the flexibility to do so;
- Enable the State to focus on the building of infrastructure and address the interoperability issues that present current obstacles in building a statewide communication system;
- Enable us to partner with local governments to build a cohesive, comprehensive, wireless communications infrastructure that will benefit all users; and,
- Pave the way for use of 700 MHz frequencies when they become available in 2006 to 2010.

To accomplish this plan we would:

- Establish a dedicated Wireless Technology Infrastructure Funding Source;
- Take an active part in the 700 MHz planning process headed by the FCC; and
- Develop a Smart Growth/One Maryland plan for the State's future radio system that is operationally, fiscally, and economically feasible.

To fund the plan, including the infrastructure and interoperability improvements, we recommend the following:

- Year one, FY 2000, augment the \$4 million allocated for emergency power generators, back up battery power supplies, and equipment shelters and the \$2 million allocated by the General Assembly for infrastructure development in support of a statewide wireless communications system and implement critical sites already identified;

- Year two, FY 2001, submit budget request for \$10 million in PAYGO funds for inclusion in base budget to improve infrastructure that supports a Statewide system; and
- Year 3 through 10, retain \$10 million in the base budget to continue to improve infrastructure to support a statewide system.

LICENSE STATUS

Based on the Oversight Committee finding that the appropriate number of frequencies did not exist to build a comprehensive statewide communications system, a letter was delivered to the Chairmen of Region 20 (Attachment II) requesting that Maryland maintain the usage of 10 frequencies. These frequencies will be used by the University of Maryland College Park and Baltimore Washington International Airport to build an 800 MHz communications system for their use. Whereas, Region 20 reviews applications and makes recommendations through an internal review process, it was also requested that preference be given to Maryland's jurisdictions with requests before them for the 38 frequencies given up.

At this time, Region 20 is still reviewing requests and making assignments. The process is very complex and takes a series of months to publish draft assignments, receive and review comments, publish comments, and hold hearings for appeals. The chart below shows draft frequency assignments for Region 20 as of October 18, 1999. These are only draft assignments and are still subject to change. It is anticipated that frequency allocations will not be finalized for at least 6 months.

Jurisdiction	Frequencies Requested	Frequencies Received
BWI	5	5
UMCP	5	5
Baltimore Central Booking	5	5
Carroll County	1	1
Queen Anne's/Talbot County	10	10
Howard County	15	15
Charles County	8	8
St. Mary's County	10	10
Harford County	15	11
Prince George's County	5	2
Montgomery County	8	1

REQUEST FOR PROPOSAL

Prior to the formation of the Executive Oversight Committee, the State issued a revised Request for Proposal for a statewide wireless communications system. Considering the plan put forth by the Committee and the responses received to that solicitation, it was determined that it would not be financially advantageous for the State to move forward with this solicitation. It should be noted that each vendor that responded stated that 48 frequencies would not be adequate for a statewide communications system. This conclusion is consistent with the recommendation of the Committee. Therefore, the solicitation was canceled.

IMPLEMENTING BEYOND 800

To further develop the framework and identify specific projects to begin building a statewide communications system, the Oversight Committee appointed three subcommittees; infrastructure, interoperability, and alternative wireless communications. The membership of the Committees is provided as Attachment III. These subcommittees identified specific infrastructure projects to fund in FY 2000 and 2001, future projects to be studied, interoperability guidelines, an interoperability pilot project, and an alternative wireless communications pilot. In addition, a recommendation was made to hire a consultant to oversee the building of the system and make project recommendations. The final recommendations presented by the subcommittees and adopted by the Oversight Committee are listed below.

Subcommittee on Infrastructure

The first approved recommendation is to use the \$2 million appropriated in FY 2000 for infrastructure projects in support of a statewide wireless communications system and implement critical sites already identified.

There are several tower and microwave projects underway that need immediate funding that will fit into the future requirements of any statewide 700 MHz (or other) system. These include Towers at Vienna (Dorchester), Trappe (Talbot), Wye Mills (Talbot), Millington WMA (Kent), Elk Neck (Cecil), Madonna (Harford), Rt. 155/95 (Harford/Cecil) and Princess Anne MSP (Somerset).

Microwave connectivity for the new DNR communications facility in Annapolis to the MIEMSS Communications backbone system, and microwave upgrades for converting overloaded analog microwave to digital high capacity are immediately needed.

A cost sheet is attached as Attachment IV and fact sheets are attached for each of the nine projects as Attachment V. These projects are considered Phase-One of a multi-year effort to provide statewide communications for all of the public safety users. The total cost of the nine projects exceeds the \$2 million appropriation based on per project costs. It is anticipated that a 10% to 15% savings will result from bidding these as one project.

The second approved recommendation, of Phase-two of a multi-year effort, requests that \$10,000,000 be appropriated in FY2001 to begin addressing tower and microwave projects listed in Attachment VI. These projects are listed by county and have been chosen based on imminent needs of the State and the local jurisdiction. The projects, covering 19 jurisdictions within the State, will greatly improve current communications and form a strong structural base for a future statewide system. It is expected that each State agency impacted and communication experts from the impacted jurisdiction will provide planning and management service. Total project costs exceed the FY 2001 recommended request based on per project estimates. It is again anticipated that a 10% to 15% savings will result from bidding tower and microwave sites as one project.

We cannot stress enough that the opportunity to partner with the local jurisdictions is time limited. The sharing of resources exists in many locations currently. Where the need to construct facilities to meet existing needs of the county is imminent, the state can contribute

resources today and share other county owned resources in the future. A resource sharing agreement is being discussed now with Queen Anne's and Talbot Counties. It is attached as Attachment VII. In this agreement, the State will build a new tower and a shelter on SHA right-of-way and the counties will expand the capacity of the digital microwave segment. The counties will also provide the State access to their existing towers at Sudlersville, Maryland Route 18 Park, Centreville Emergency Operations Center and Easton. The microwave expansion and use of existing towers will save the State approximately \$500,000. Whereas, each resource sharing agreement will incorporate the needs of the State and local jurisdiction at that time, the Queen Anne/ Talbot County agreement will serve as the model.

Subcommittee on Interoperability

The Oversight Committee approved the following recommendations from the Subcommittee on Interoperability:

1. This is not just a State of Maryland issue, but rather a governance issue. Look at interoperability from a global perspective as it impacts Federal, State and Local users within Maryland. Public Safety radio users have been the prime mover in this process, but examine other communications relationships that may not be apparent on the surface. Some of these other relationships may enhance communications in ways yet to be seen.
2. Conduct an inventory of interoperability methods within Maryland that are in place today. In addition to Maryland, survey other countries, federal and state governments for a different perspective to what seems a universal problem.
 - A. What works and how?
 - B. What does not work and why?
 - C. What replacements and upgrades are planned to existing methods?
 - D. What levels of interoperability are used within Maryland?
 - i Day to Day
 - ii Mutual Aid
 - iii Task Force
3. People are a key part of any communications system.
 - A. Develop a generic operating protocol to serve as a benchmark.
 - B. Develop training methods and approaches tailored to the user group. For example, tutorials, quick reference cards, computer-based training and video tapes.
4. Explore interoperability technologies to determine what is the right pick for a given situation. It is expected that no one method is right for all cases. But, that the solution may be a combination of several. Knowing that the right solution, is dependent on operational, technical and budget constraints.
5. Develop an interoperability pilot project for fiscal year 2001.

A. Infrastructure based system.

Design an infrastructure-based system to provide interoperability in St. Mary's County. St. Mary's County is an ideal candidate since they are in the early design stages of an 800 MHz trunked radio system. They are neighbors to an existing 800 MHz trunked radio system, federal agencies, state agencies (Maryland & Virginia) and another county that uses a conventional radio system.

The goal of this project is to allow each of these agencies to intercommunicate "on demand" with each other in a smooth effective manner.

Estimated cost for this pilot project is \$225,000.00¹

B. Direct based system

Several locations within Maryland now use portable radios on an existing allied agencies' radio system for the purpose of interoperability. Analyze these existing systems for effectiveness and costs.

C. Compile the information gained from parts A and B above to create a work plan for the application of appropriate methods to provide and enhance interoperability between radio systems.

6. Keep the subcommittees together to continue their work. A great deal of work is ahead of us as these questions and recommendations are acted upon. As the *Executive Oversight Committee* formally comes to an end soon, transfer leadership over to the Secretary of the Department of Budget and Management to keep this momentum going. The Secretary is a tri-chair member of the Task Force on Public Safety Technology.
7. Hire an outside engineering firm to assist with the day-to-day design and data collection. This work is too important to continue a heavy reliance on the Agencies communications professionals to fit this in on a part-time basis. Let the agency professionals provide the concept, direction and oversight while the engineering firm provides the legwork.
8. Interoperability costs real money! Determine methods that make interoperability solutions appealing so that Maryland's jurisdictions want to belong. To date- we have not "built the better mouse trap" for interoperability. But, we believe its possible.

This group will continue its work researching practices in other states and developing operating protocol and training methods. It is recommended that this group stay intact under the Task Force on Public Safety Technology. This group will also begin to lay the framework for the interoperability pilot which will begin in early FY 2001. The goals and implementation schedule for the pilot are listed below. Additional information pertaining to interoperability and the pilot presented by the Subcommittee is attached as Attachment VI.

¹ \$100,000 (audio switch) + \$125,000 (five base stations at five sites) = \$225,000

PROPOSAL FOR FY 2001

Develop and implement a "user friendly" interoperability pilot project for fiscal year 2001. Such a system is not in place now within Maryland, while there are several examples of shared systems. Analyze information from the shared systems for effectiveness and costs.

Specifics of Infrastructure Based Pilot System.

The goal of this project is to allow each of these agencies to intercommunicate "on demand" in real time with each other in a smooth effective manner.

Design an infrastructure-based system to provide interoperability in St. Mary's County. St. Mary's County is an ideal candidate since they are in the early design stages of an 800 MHz trunked radio system and have an awareness of interoperability. They are neighbors to an existing 800 MHz trunked radio system, federal agencies, state agencies (Maryland & Virginia) and another county that uses a conventional radio system. Such a system would provide an excellent test platform to interface with multiple agencies and radio systems.

Project Time line

FY 2000	Identify user agencies and gather operation requirements. Design system operating requirements and prepare bid documents. Develop operating conventions and protocols.
FY 2001	Install system, test, tweak and begin operation. Gather data from existing shared systems. Estimated cost for this pilot project is \$225,000.00 ²
FY 2002	Operate system under real and exercise conditions. Complete operational effectiveness by end of FY2002.
FY 2003	Compile the information gained from research results to create a work plan for the application of appropriate methods to provide and enhance interoperability between radio systems within Maryland.

Conclusion

Interoperability is not a one size fits all, it is expected that no one method is right for all cases. Knowing that the right solution is dependent on operational, technical and budget constraints. Having this base data from the proposed St. Mary's County project, will allow the application of real world knowledge in Maryland's desire to improve public safety communications.

Subcommittee on Alternative Wireless Communications

The Oversight Committee approved two recommendations for pilot projects from the Subcommittee on Alternative Wireless Communications. The pilots will involve Voice

² \$100,000 (audio switch) + \$125,000 (five base stations at five sites) = \$225,000

Administrative Communications and Remote Data Communications. It is anticipated that, using existing contracts, it will cost approximately \$100,000 to lease or buy the equipment for the pilot programs. The pilots will set standards and create protocol for testing all equipment hardware, software and range capabilities of the equipment that is used. Many agencies have been identified as potential pilot sites. The subcommittee will now begin working with agencies to determine their specific needs. Once needs are determined, it will be decided which agencies will begin the piloting process based upon costs and the level of benefit the project will provide. It is envisioned that the pilots will offer seed money to the agencies. The standards and protocol developed by the subcommittee will be used by each agency individually assess the impact of the equipment. This information will form a "position paper" to be used by agencies to further justify equipment purchases in their budgets to make procedures operational on a permanent basis.

Voice Administrative Communication pilots are recommended for the following agencies: Department of Public Safety and Correctional Services, Division of Parole and Probation and Home Detention, Department of Natural Resources, Department of Business and Economic Development – Tourism, Maryland Emergency Management Agency, and MIEMSS. This pilot will involve 2-way and 1 way paging and cellular phones and assess the impact of extensive use of communications between remote locations and a main hub. For example, parole officers could be paged to check on home detainees and respond back with pre-programmed responses. Many agencies currently have paging devices and cellular phones, but on a limited basis for certain personnel. These pilot opportunities will provide more widespread use of various devices to improve communications between agency personnel and clients to increase efficiency and productivity.

Remote Data Communication pilots are recommended for the following agencies: Maryland State Police, State Highway Administration – CHART and Emergency Response Units, Comptrollers Office, Maryland Transportation Authority, Maryland Emergency Management Agency, and MIEMSS. This pilot will make use of wireless laptop computers and the wireless web to access and distribute data information to and from a remote location. For example, the State Police would have direct access from their patrol cars to driving records and have the capability to create traffic tickets. Another example, is gas pump inspectors within the Comptrollers Office who could be able to access central computers for tax information right from the location being inspected.

Other examples of some pilot applications are as follows:

- Mobile fax. Mobile facsimile facilities will provide the mobile user with the capability to receive documentation required for standard or emergency situations. A prime example of the use of mobile fax capabilities would be the receipt of a Material Safety Data Sheet at the scene of a hazardous materials incident.
- Mobile imaging. This could be used in several applications, e.g. NCIC 2000, road condition monitoring, observation of passengers or prisoners during transport, etc..
- Mobile computing. Laptop or notebook computers could be used by field technicians, to enter data or diagnosis and transmitted directly to the home office. Laptop or notebook computers placed in a "docking station" in a vehicle and an office will provide an

employee with real-time access to multiple databases located in various State, local, and Federal agencies.

- Mobile office. Integrate some or all of the above features into a mobile office setup. Create the "virtual office".
- Computer Aided Dispatch (CAD). This will also allow for real-time traffic pattern diversion and detouring. A CAD system will incorporate Geographic Information Systems (GIS) databases to provide the field units with "on-screen" maps of response locations, building layouts, etc. on mobile data terminal screens. CAD systems also eliminate the need for routine voice dispatch and responses. CAD systems provide excellent information for resource management as well as the ability to enhance employee safety by displaying up to the minute status and progress as each employee responds to, and process calls for service. Many CAD systems employ vehicle location technologies over existing communications infrastructures to locate and track vehicles and employees, greatly enhancing employee safety.
- Automatic Vehicle Location. The use of vehicle location technology, such as Global Positioning Satellite (GPS) transceivers or Time Difference On Arrival (TDOA) techniques, integrated with mobile data terminals and digital radios would permit "real-time" monitoring of vehicle, or personnel, location. This feature will enhance response times, integrate with CAD and GIS systems, and provide accurate, to-the minute information concerning vehicle location during an emergency situation (e.g., a medical emergency).
- Automatic Vehicle Maintenance/Monitoring. This feature could be integrated with maintenance computers to monitor a vehicle performance and possibly prevent catastrophic failure or could be used to schedule routine preventive maintenance.
- Provide technology and transportation medium for the public mobile implementation of CHART, the State's Intelligent Transportation Systems (ITS).

The Subcommittee will begin its work now setting standards and operating protocols for the pilot projects. It is anticipated that some pilots will begin during FY 2000.

STATEWIDE COMMUNICATIONS COORDINATING ACTION TEAM

Another recommendation of the Subcommittee on Infrastructure is to form a long term oversight group to prepare budget recommendations, find existing resources and capabilities, determine needs of existing systems and funding requirements, and manage the projects until completion. Although a formal vote was not taken, this recommendation was discussed and had full agreement from the group. It is also logical to have a group such as this to coordinate activities across agencies and with local jurisdictions. This will assist in meeting both State and local needs.

The group will be called the Statewide Communications Coordinating Action Team, and will include the following members: one member from the Lt. Governor's Office representing the Task Force on Public Safety Technology; one member from DBM's telecommunications division, one member from each State public safety agency (defined as eligible for public safety or local government spectrum); one member from each of the 23 counties and Baltimore City; one representative from DBM representing the Task Force on High Speed Network Digital

Development; two representatives from the Maryland Department of Transportation; and a member from a federal public safety agency. It is anticipated that members representing local jurisdictions would only be involved in discussions that pertain to their jurisdictions or surrounding areas that have an impact on their systems. Representatives from each local jurisdiction will not be brought in for each discussion.

This body will also oversee the work of the consultant. As the consultant identifies state and local infrastructure and interoperability needs, day to day system design, and data collection, it will work directly with this group to prioritize projects and assist with negotiating resource sharing agreements between the state and local jurisdiction.

It is imperative that the momentum and enthusiasm generated by the Oversight Committee be maintained. For this reason, it is suggested that the same technical representatives from State agencies and local jurisdictions serving on the Oversight Committee become members of this coordinating team.

TASK FORCE ON PUBLIC SAFETY TECHNOLOGY

The Task Force on Public Safety Technology was created by Lt. Governor Townsend to bring cutting edge law enforcement and corrections technologies to State and local criminal and juvenile justice agencies. Secretary Puddester is a co-chair of this group. One of the many charges of the Task Force is to work with DBM to develop an implementation plan for establishment of a Statewide wireless communications system that provides State agencies with cutting edge wireless voice and data capabilities and supports the efforts of State and local public safety agencies to implement mobile data computer systems and allows public safety agencies across the State to communicate with each other via a handheld or vehicle mounted wireless communication device. Now that the Executive Oversight Committee has completed its task, it is being merged with the Task Force. The Task Force will provide oversight and advocacy of the Beyond 800 plan. The Task Force will also serve as the advisory group for the Statewide Communications Coordinating Action Team and the consultant.

The Executive Oversight Committee has generated a large amount of support and cooperation from state agencies and local jurisdictions. It has been said by many involved that this is the first time that State agencies have reached out to one another to form bonds to move this communication project forward. We do not want this momentum to stop. It is suggested that the membership of the Task Force be expanded to include the membership of the Oversight Committee. This is also consistent with representation on the SCCAT.

It is envisioned that these individuals will also become members of the emerging technologies committee chaired by Secretary Puddester. The committee will identify and examine emerging technologies available to public safety entities on a statewide basis, including wireless communications systems, voice and data capabilities that support the efforts of State and local public safety agencies to implement mobile data systems and enable public safety agencies across the State to communicate with each other via a handheld or vehicle mounted wireless communications device.

COORDINATION WITH THE INFORMATION TECHNOLOGY BOARD AND THE HIGH SPEED NETWORK TASK FORCE

The Information Technology Board advises the Chief of the Office of Information Technology in the development of the information technology master plan for Maryland. This plan is the basis for the management and direction of information technology within the Executive Branch and includes all aspects of information technology such as telecommunications and data processing. The plan also ensures that State information technology plans, policies, and standards are consistent with State goals, objectives, and resources and represent a long-range vision for using information technology to improve the overall effectiveness of State government. These standards and policies have been incorporated into Maryland's statewide communications plan and must continue to be as we move forward with long range planning.

Coordination must also exist with the Task Force on High Speed Network Development. The Task Force is charged with studying regions where high speed computer networking is progressing, evaluating the advantages of developing high-speed computer networking throughout Maryland, and recommending State policies for the development, promotion, and equitable use of high speed computer networking, as well as the specific equipment, configuration, and location that would provide effective statewide access. A goal of the Task Force is to build a network infrastructure that will be the foundation for Maryland's "digital highway". The plan creates a common backbone as well as the development of common standards that will enable many networks to interconnect with the backbone and with each other. The backbone will provide very high-speed long-haul capacity and will enable consolidation of redundant wide area networks, reduce costs, and provide very high capacity to handle multimedia applications such as voice, video and data.

The State recently entered into a contract with Level (3) to begin laying Maryland's high-speed backbone. Under this contract, 330 miles of fiber optic cable will be laid across Maryland connecting western, southern, and the upper Eastern Shore. The cable will also link Maryland with Delaware, Pennsylvania, and West Virginia. This backbone is a crucial component of a statewide public safety communication systems in that it will provide the necessary infrastructure for voice/data transmission, increase the speed of transmission, and assist with interoperability.

The development of a high speed network and a public safety statewide communications system compliment one another. The high speed network will provide levels of inter-connection between tower sites and offer minimal levels of emergency redundancy where feasible. As we move forward with long range planning of a statewide communications system, activities must be coordinated with the Task Force to be sure we are making efficient use of our resources.

CONCLUSION

The Executive Oversight Committee on the Implementation of a Statewide Communications System for Maryland has successfully created a plan, and has begun to implement that plan, to build a Statewide communications system. A continuous funding source has been identified, as well as infrastructure projects for the current and future fiscal years. The Oversight Committee has also begun to explore methods to improve interoperability and uses of alternative wireless communications to increase efficiency of operations. In addition, strong advisory and coordinating bodies have been identified to ensure the plan moves forward over the next several years to reach our goal. Working together in this forum, with other Statewide groups, local jurisdictions, and the Legislature, Maryland will successfully provide the highest quality public safety communications service to the citizens of Maryland.

Attachment I

EXECUTIVE OVERSIGHT COMMITTEE ON THE IMPLEMENTATION OF A STATEWIDE COMMUNICATIONS SYSTEM FOR MARYLAND

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2500 Broening Highway
Baltimore, MD 21224
(410) 631-3089

MDE

Fred Puddester, Secretary
Department of Budget and Management
45 Calvert Street
Annapolis, MD 21401
(410) 260-7041

DBM

Senator Ida G. Ruben
100 James Senate Office Building
Annapolis, MD 21401
(410) 841-3634

Senate Budget and
Taxation Committee

Gary Thorpe, Deputy Comptroller
Comptroller of the Treasury
Louis L. Goldstein Treasury Building
80 Calvert Street
Annapolis, MD 21401
(410) 260-7308

Comptroller's Office

Sharon Lechowicz, Director of Administration
Maryland Transportation Authority
850 Revell Highway
Annapolis, MD 21401
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MDOT

John Contestabile, Director of Administrative
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Maryland Department of Transportation
P.O. Box 8755
BWI Airport, MD 21240-0755
(410) 865-1120

MDOT

Clay Stamp
Ocean City Emergency and Communications
Manager
6501 Philadelphia Avenue
Ocean City, MD 21842
(410) 723-6602

Rural/Suburban
Member

Maryanne Viverette, Police Chief
7 East Cedar Avenue
Gaithersburg, MD 20877
(301) 258-6400

Suburban Member



Maryland Department of Budget & Management

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a partnership for the new millennium*

Attachment II

Office of the Secretary

PARRIS N. GLENDENING
Governor

FREDERICK W. PUDDISTER
Secretary

T. ELOISE FOSTER
Deputy Secretary

July 20, 1999

Mr. Steven Souder
Chairman
Region 20 Regional Plan Review Committee
14 North Uhle Street
Arlington, VA 22291

Dear Mr. Souder:

On behalf of Governor Parris N. Glendening and Lt. Governor Kathleen Kennedy Townsend, I am writing to request that the State of Maryland retain usage of ten (10) 800 MHz frequencies and maintain the usage of the additional 38 frequencies by reallocating them to local jurisdictions within Maryland that have current requests before Region 20. The University of Maryland College Park and BWI Airport would use the ten frequencies retained with your concurrence. Both of these State organizations have dollars earmarked to build an 800 MHz communications system for their use. Whereas, we understand that Region 20 reviews applications and makes recommendations through an internal review process, it is our hope that during your deliberations to reallocate frequencies, preference will be given to Maryland's jurisdictions and the State will maintain the use of the frequencies being given back to the pool.

In our correspondence dated April 19, 1999, we indicated that the State issued a revised Request for Proposal for a statewide wireless communications system. If a responsible and responsive vendor were selected, we would have proceeded to request an extension of the existing State licenses for a two-year period. At this time an appropriate vendor has not been selected.

In concert with this activity, the State has appointed an Executive Oversight Committee to determine how Maryland should proceed with the building of a statewide wireless communications system. It has become apparent that many local jurisdictions and State agencies would benefit from the immediate use of these licenses, whereas the State would need to lay the groundwork. In addition, we question whether a quality system could be built with only 48 frequencies. We have determined that it is in the State's best interest to start building the infrastructure and address the interoperability issues that present current obstacles in building a statewide communication system. This gives organizations within the State and local jurisdictions that have resources to build or improve systems the flexibility to do so with the granting of additional frequencies.

As previously stated, the University of Maryland College Park and BWI Airport have money earmarked to build their respective systems. At this time, the following local jurisdictions with resources or contracts in place have requested a total of 76 frequencies from the FCC through Region 20:

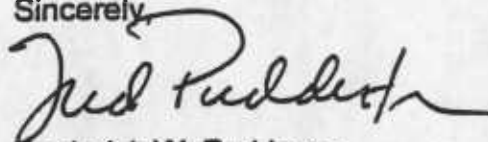
St. Mary's	10
Harford	15
Queen Anne's, Talbot & Caroline	15
Montgomery	8
Charles	8
Howard	15
Prince George's	5.

Even though the number being requested exceeds those being relinquished, we recognize the valuable nature of this resource and hope that you will agree to reallocate the 800 MHz frequencies to these jurisdictions. These areas will greatly benefit from the use of the additional frequencies.

As for the State as a whole, we will begin to prepare for the next wave of wireless communications. We will work to establish a Wireless Technology Infrastructure Funding Source to address infrastructure and interoperability issues and develop a plan for the States future radio system that is operationally, fiscally, and economically feasible. Our long-term goal is to have a statewide system with capacity for all State government with room for local and federal government users and easy interoperability. The local jurisdictions within Maryland have always worked cooperatively in the past to share resources and we fully expect this relationship to continue.

Thank you for your consideration of this request. If you have any questions or comments please do not hesitate to contact me at 410-260-7041. I look forward to hearing from you regarding the status of this request in the near future.

Sincerely,



Frederick W. Puddester
Secretary

cc: Governor Parris N. Glendening
Lt. Governor Kathleen Kennedy Townsend
T. Eloise Foster, DBM
Alisoun Moore, DBM
Preston Dillard, DBM

Attachment III

Subcommittee Membership

Subcommittee of Infrastructure

Tom Miller, Chair
MIEMSS

Mike Zezeski
State Highway Administration, MDOT

The Honorable Wheeler Baker
Maryland House of Delegates

Karl Damanda
Department of Budget and Management

Craig Fetzer
State Highway Administration, MDOT

David Wise
Dept. of Business & Economic Development

William Taylor
Anne Arundel County

G. Allen Eberwein
Military Department

W. Van Aller
Montgomery County

Dan Sheffield
Prince George's County

Dottie Nobel
Department of Juvenile Justice

Clay Stamp
Ocean City

John O'Neill
Harford County

Richard A. Bohn
Maryland State Police

Ed Mullikin
Talbot County

John Frazier
Baltimore City Fire Department

Wendel Jones
Department of Natural Resources

Jack Forsythe
Prince George's County

Subcommittee on Interoperability

Alan T. Kealey, Co-Chair
Department of Natural Resources

Stephen Allen
B.W.I. Airport Fire and Rescue

Michael Bennett, Co-Chair
Maryland State Police

Robert Brady
Calvert County

Honorable Patrick J. Hogan
Maryland Senate

Charles Dennis
Baltimore County

Honorable Ida G. Ruben
Maryland Senate

Bill Jones
U.S. Coast Guard

Sharon Lechowicz
MD Transportation Authority

Lawrence Priebe
Department of the Environment

Dan Shetfield
Prince Georges Police Dept.

David Williams
U.S. Coast Guard

David McMillion
MD Emergency Management Agency

John R. Frazier
Baltimore City Fire Department

Alan Williams
Department of the Environment

Subcommittee on Alternative Wireless Communications

Edward Ryan, Chair
Department of Budget and Management

Lewis Logan
Treasurer's Office

Conard Carnell
Department of Juvenile Justice

John Contestabile
MD Department of Transportation

Dottie Noble
Department of Juvenile Justice

Attachment IV

PROJECT DATA SHEET FOR FY-2000 800 MHz FUNDS PHASE - ONE					
County	Project #	Type	Site	Estimated Cost	Totals
Anne Arundel	2000-01	Microwave to Parole MSP	CM6-28DS1 Tawes DNR/MSP	\$150,000	
		Microwave to Crownsville	CM6-28DS1 Parole	\$150,000	
					\$300,000
Dorchester	2000-02	Tower - 340 ft	Vienna SHA/MIEMSS	\$125,000	
					\$125,000
Talbot/QA	2000-03	Tower - 340 ft	Wye Mills SHA	\$225,000	
		Shelter	12x28 MIEMSS CFG	\$75,000	
					\$300,000
Talbot	2000-04	Tower - 340 ft	Trappe SHA	\$225,000	
		Shelter	12x28 MIEMSS CFG	\$75,000	
					\$300,000
Cecil	2000-05	Tower - 340 ft	Elk Neck DNR/MIEMSS	\$225,000	
					\$225,000
Harford	2000-06	Tower - 340 ft	Madonna DNR	\$225,000	
					\$225,000
Harford/Cecil	2000-07	Tower - 340 ft	RT-155/I-95	\$225,000	
					\$225,000
Somerset	2000-08	Tower - 340 ft	Princess Anne MSP	\$225,000	
		Shelter	12x28 MIEMSS CFG	\$75,000	
					\$300,000
Kent	2000-09	Tower - 340 ft	Millington WMA DNR	\$225,000	
		Shelter	12x28 MIEMSS CFG	\$75,000	
					\$300,000
		FY-2000 Project Total (See Note 1)			\$2,300,000

Note 1: The total cost does not consider the savings incurred through the competitive procurement process. It is anticipated that if all of the above projects are procured as a single project, savings of 10 to 15% could be expected.

Attachment V

Fact Sheet

Project 2000-01

Microwave Path -- Tawes to Parole to Crownsville

1. Type of Project

This project provides connectivity to the statewide microwave backbone network for the Department of Natural Resources and the Natural Resource Police communications facility located in the Tawes building in Annapolis. It will also make possible the connection of the Annapolis MSP Barrack by way of local fiber connecting state buildings. Two hops of microwave, from Tawes to the Parole Tower and from the Parole Tower to the MIEMSS Crownsville Tower are needed.

2a. Cost

The cost of two hops of digital microwave, including multiplex equipment, is estimated at \$300,000.

2b. Justification

The microwave equipment will permit a marked improvement in reliability for the DNR and MSP communications systems. Savings of many thousands of dollars of monthly-dedicated phone line lease expenses will be realized. The ability to cross connect the affected agencies will provide added interoperability.

3a. Benefits to State

Improvement in the reliability, the quality, and reduced cost over the life of the equipment are the main benefits to installing microwave equipment. The connection of the Parole tower to the MIEMSS microwave backbone will facilitate any future communications technologies.

3b. Benefits to Counties

N/A -- This is a state project.

4. Sharing Arrangements

N/A -- This is a state project.

5. Importance of Project

The main statewide communications center for DNR and NRP at the Tawes building requires connectivity to remote radio base station equipment located throughout the entire state. Because the state is divided into four telephone LATAs and the need to lease dedicated phone circuits from long distance providers makes for high recurring monthly expenses. A typical leased line from Annapolis to Allegany County cost about \$1000 per month. If the agency has several 10's of these lines, the payback period can be as little as 3 to 5 years. Because microwave radio equipment has an expected service life of 15 to 20 years, the project will pay for itself several times over.

Project 2000-02
Vienna Radio Tower Replacement

1. Type of Project

This project involves constructing a new 340-foot self-supporting communications tower at an existing site. The new tower will replace an existing 200-foot guyed air quality monitoring tower that was donated to MIEMSS in 1980.

2a. Cost

It is estimated that the cost of a new tower will be \$125,000.

2b. Justification

The existing tower is approximately 35 years old and is near the end of its useful life. One tower maintenance contractor is reluctant to climb this tower due to the unsafe condition and age of the guy system. The contractor has recommended replacing the guy system. The height of the existing tower is insufficient for the higher frequencies (700 MHz) due for release to public safety in the future. Because this is a primary site used by many state agencies, we recommend funding this project as an infrastructure project.

3a. Benefits to State

Several State agencies, including MIEMSS, SHA, MSP, and DNR, utilize this site. This tower is a part of the MIEMSS backbone microwave system and is used by all of the above state agencies. The land is part of the SHA right-of-way.

3b. Benefits to Counties

This site benefits three counties, Dorchester, Wicomico and Caroline Counties through the EMS system. At this time, there are no county communications facilities at this site.

4. Sharing Arrangements

At this time, there are no county systems on this tower. Once the new tower is constructed, Dorchester County will utilize it for their 800 MHz communications system. In return, the county will permit the state to locate future 700 MHz equipment at their Bucktown Road tower site, a 400-foot county public safety tower.

5. Importance of Project

Located on Rt-50, on the border of Wicomico and Dorchester Counties, this site is critical for the existing public safety communications. Any future UHF 700 MHz system will most assuredly use and have need for this site.

Project 2000-03
Wye Mills Tower

1. Type of Project

Construction of a new 340-foot self-supporting communications tower and a MIEMSS configuration shelter on SHA right-of-way.

2a. Cost

The estimated State cost for this project is \$300,000. The land is SHA right-of-way. The cost of the county building will be refunded to the state by Queen Anne's County and is expected to be about \$40,000.

2b. Justification

Queen Anne's and Talbot Counties are in the process of constructing a new 800 MHz trunked communications system. The project design calls for a tower in the Wye Mills area that will serve as the hub. The DNR, MIEMSS, and SHA have determined a need for improved radio coverage in this area. This site will serve as a node of the backbone microwave system. The counties have agreed to expand the capacity of the microwave segment at their cost (\$250,000) if the state provides this site. In addition, the counties will provide access to their existing towers at Sudlersville, Rt-18 Park, Centreville EOC, and Easton for current and future state systems.

3a. Benefits to State

There is an immediate need for radio coverage in the Wye Mills region. By joining the three counties in building this infrastructure, the state will enjoy immediate benefit with their existing systems and future access to the county sites for any 700 MHz statewide system.

3b. Benefits to Counties

The two counties are faced with the decision to lease space on existing commercial towers, or use the resources from the state. If the state provides the land and the towers at this time, the counties will save on leasing cost, will have a more secure facility (only public safety at the site), and will have a long-term stable resource.

4. Sharing Arrangement

If the state constructs these facilities, the counties will enjoy a long term, stable resource and can apply the funds that would be needed to lease the tower space toward upgrading the digital microwave system. This will permit use of the microwave for existing and future needs of the state. The counties have agreed to expand the capacity of the microwave segment at their cost (\$250,000) and provide access to their existing towers at Sudlersville, Rt-18 Park, Centreville EOC, and Easton for current and future state systems. The use of the microwave segment and existing towers will save the state approximately \$500,000. In addition, the counties will provide a shelter for the 800 MHz system.

5. Importance of Project

This is a very time sensitive project, as the two counties have a contract with Motorola to build the system and begin testing in March of 2000. If we can provide the towers quickly, the counties will co-locate with the state and will provide the microwave connectivity we both will need now and in the future.

**Project 2000-04
Trappe Tower**

1. Type of Project

Construction of a new 340-foot self-supporting communications tower on SHA right-of-way. Provide a communication shelter that will be shared by the state agencies and the tri-county 800 MHz communications system.

2a. Cost

The estimated State cost for this project is \$300,000. The land is SHA right-of-way. Talbot County has agreed to pay \$25,000 toward the construction of the communications shelter.

2b. Justification

Queen Anne's and Talbot Counties are in the process of constructing a new 800 MHz trunked communications system. The project design calls for a tower in the Trappe, MD area that will serve as the spur site for the system. The DNR, MIEMSS, and SHA have determined a need for improved coverage in this area. The SHA will use this site in place of a new tower at their Cambridge shop and will save on that cost. This site will serve as a node of the statewide microwave backbone system. In addition, the counties will provide access to their existing towers at Sudlersville, Rt-18 Park, Centreville EOC, and Easton for current and future state systems.

3a. Benefits to State

Again, by construction of this site, the state will gain access to several county sites and the expanded digital microwave system. This will eliminate a tower at the Cambridge SHA facility.

3b. Benefits to Counties

The two counties are faced with the decision to lease space on existing commercial towers, or use the resources from the state. If the state provides the land and the towers at this time, the counties will save on leasing cost, will have a more secure facility (only public safety at the site), and will share the expenses of the infrastructure.

4. Sharing Arrangements

This is a shared project in that Talbot County will provide the microwave link from Easton to this site, estimated to cost around \$200,000. The state will have access to channel capacity on this microwave system.

5. Importance of Project

This is a very time sensitive project, as the two counties have a contract with Motorola to build the system and begin testing in March of 2000. If we can provide the towers quickly, the counties will co-locate with the state and will provide the microwave connectivity we both will need now and in the future.

Project 2000-05
Elk Neck Tower

1. Type of Project

This is a new communications site located in the Elk Neck State Forrest in Cecil County. A 340-foot self-supporting tower is planned for this site.

2a. Cost

The total cost of this site is estimated to be \$225,000.

2b. Justification

This site will replace two existing towers, one at the Maranatha Church and one fire tower at Black Hill. The Maranatha tower is used by MIEMSS as a region- three medical communications site and is considered to be marginal for the antenna load that currently exist. The second site is a 110-foot fire tower and does not provide adequate radio coverage for the DNR and the FBI. In addition, the county will need the additional tower for its future UHF communications system.

3a. Benefits to State

Improved radio coverage from a taller tower on higher ground and connectivity to the backbone microwave system will benefit all of the state agencies planning to locate at this site. This site will also permit linking to the Northeast MSP Barrack by microwave.

3b. Benefits to County

Should Cecil county desire to expand their communications system to include VHF or UHF frequencies, the height of this tower will make this a desirable site and will provide the necessary radio coverage. This will eliminate the need to add an additional tower in the area.

4. Sharing Arrangements

Cecil County currently allows access to their microwave system for the MIEMSS Communications network. MEMA access to the local PSAP (911 center) can also utilize the county microwave system to permit inter-operability. Other State agencies (DNR, MSP, SHA, etc.) will share this facility.

5. Importance of Project

The new tower will fit nicely into the plan for any future 700 MHz communications system. The need to vacate the Maranatha tower will eliminate funding an additional tower in the Elkton area. The ability to upgrade the microwave to digital technology will prepare the state for any future system.

Project 2000-06
Madonna Tower Replacement

1. Type of Project

This is a replacement 340-foot self-supporting tower, shelter, and microwave system. The site is located at the Madonna Forestry Station in western Harford County.

2a. Cost

This project is estimated to cost \$225,000.

2b. Justification

This tower will replace three existing towers at the site. A self supporting 180 foot tower owned and used by Harford County, a 180 foot monopole owned by the state and used by MIEMSS, and the MSP, and a short guyed tower used by DNR. The MIEMSS monopole is nearing the end of its useful service life and is unsuitable for the larger solid dish microwave antennas needed for digital 6 GHz microwave.

3a. Benefits to State

By sharing this tower with the county, the state will gain access to other towers owned by the county. The possible sites include Whiteford, Hickory, and Joppa-Magnolia towers. The community impact includes the removal of three existing towers at the site.

3b. Benefits to Counties

The county will gain access to a taller tower that is necessary for proper coverage at the higher frequency band. By sharing the site, the county will save on the cost of the tower.

4. Sharing Arrangements

Harford County plans to implement an 800 MHz trunked communications system within the next two years. The Madonna tower will support this new system. The State will gain access to other towers owned by the County.

5. Importance of Project

The Madonna site will be an important resource to support any future statewide 700 MHz communications system. There is a need to replace the state owned monopole in the very near future, as it is in deteriorating condition.

Project 2000-07
Rt-155/I-95 Tower Replacement

1. Type of Project

This project is a replacement of an existing tower owned by Cecil County with a new 340-foot self-supporting tower.

2a. Cost

This project is estimated to cost \$225,000.

2b. Justification

The need for a suitable communications tower for the region of the Cecil-Harford County border has always existed. This new tower will improve communications for state agencies including SHA, MSP, MdTA, and DNR. It will replace an existing 125-foot tower owned by Cecil County. Harford County, in building a new 800 MHz system will be able to use this site as a replacement for their Lapadum site. The existing Cecil County tower is not strong enough to support larger solid digital microwave antennas.

3a. Benefits to State

This site lies on the border of Cecil County and Harford County and provides radio coverage to the Susquehanna River area, a region that normally is blocked by the terrain to radio coverage. The MdTA facilities for the I-95 toll bridge are within the coverage of this site and will serve as an entry point for microwave connectivity.

3b. Benefits to Counties

Both Harford County and Cecil County will permit use of their existing tower where technically and structurally feasible for a future statewide communications infrastructure. This site will augment their current and future needs.

4. Sharing Arrangements

Both of the counties have existing towers in the area that will not support any new antenna structures. This new facility will meet the needs of the state and both counties and permit the removal of one or more existing towers in the future. By sharing the site, the community will enjoy one or fewer towers in this area. Other towers owned by Harford County will become available for a future statewide system.

5. Importance of Project

This site is an important location needed to provide radio coverage for the Susquehanna River area, including Havre de Grace and Port Deposit. The I-95 and Rt-40 Toll Facilities can be covered from this site.

Fact Sheet

Project 2000-08 Princess Anne MSP Tower

1. Type of Project

This is a new 340-foot self-supporting tower and a 12x28-foot equipment shelter.

2a. Cost

The estimated cost of this project is \$300,000.

2b. Justification

There are no suitable state owned towers in the Somerset County region. Any future UHF or 700 MHz system will have need for this site. The MSP requirement for a tower at this new detachment will not be for a structure taller than 175 feet. Because this will serve as a part of the infrastructure for many state agencies, it is appropriate to construct this facility. MIEMSS currently leases space on a commercial tower in Princess Anne, and can relocate to this site. By using the MIEMSS microwave, all state agencies can access this new tower at little cost.

3a. Benefits to State

Elimination of annual lease expense, a strong storm resistant tower in this region is a necessity. This is a critical site that several state agencies currently have immediate need for.

3b. Benefits to County

By linking to Somerset County with microwave, this resource will benefit the county's communications systems. It will also eliminate leased dedicated phone lines to the county.

4. Sharing Arrangements

Somerset County may at some future time have a need for the coverage this site will permit. The County currently is using a Low-Band radio system for the fire and police services. If the need arises to convert to VHF or UHF, this will provide a tall tower site to support the needs. Should the County construct additional future tower sites, the State will have access to them.

5. Importance of Project

There is a critical need to provide communications service for the MSP, DNR, MIEMSS, SHA, and the Correctional Services in this area.

Fact Sheet

Project 2000-09 Millington WMA DNR Tower

1. Type of Project

This is a new 340-foot self-supporting tower and a 12x28-foot equipment shelter.

2a. Cost

The estimated cost of this project is \$300,000.

2b. Justification

There is only one state owned tower in Kent County, located in Chestertown, at the Kent/Queen Annes Hospital. Any future UHF or 700 MHz system will have need for this proposed new site, located in the eastern part of the county.

3a. Benefits to State

This site will provide needed coverage in the eastern Kent County area for the EMS communications system. Any future 700 MHz system will need a site in this region.

3b. Benefits to County

The county can relocate existing VHF equipment planned for installation at an existing water tank, and will realize improved coverage with that system.

4. Sharing Arrangements

Kent County is in the process of upgrading their radio communications network, and will share any resources they construct with the state. MIEMSS currently utilizes space on the tower located at the Kent County EOC.

5. Importance of Project

The communications services for the MSP, DNR, MIEMSS, SHA, and other state agencies is limited in the Kent County region. This tower will provide much needed improvements in coverage for the region.

Attachment VI

**PROJECT DATA SHEET FOR FY-2001
PHASE - TWO**

County	Year	Type	Site	Estimated Cost	Totals
Allegany	2001	Microwave	Town Hill to Warrior Mt.	\$150,000	
		Microwave	Warrior Mt. To Dans	150,000	
		Microwave	Dans to Cumberland EOC	150,000	
		Microwave	Sideling to Town Hill	150,000	
		Microwave	Dans to Savage Mt.	150,000	
		Microwave	Dans Mt. To High Rock	150,000	
		Tower – 200 ft.	Dans replacement tower	180,000	
		Shelter	12x28 MIEMSS CFG	75,000	
					\$1,155,000
Anne Arundel	2001	Microwave	Solly to Crownsville	\$150,000	
		Microwave	Crownsville to Annapolis NA	150,000	
		Microwave	Baltimore to Solly	150,000	
		Tower	Annapolis Rehab NSS towers	500,000	
		Microwave	Annapolis NSS to Matapeake	150,000	
					\$1,100,000
Baltimore City	2001	Microwave	Jacksonville to Madonna	\$150,000	
		Microwave	Bressler to Sinai	150,000	
		Microwave	Sinai to Jacksonville BAC	150,000	
		Microwave	Bressler to Bush St. MTA	150,000	
					\$600,000
Caroline	2001	Tower	Denton	\$225,000	
		Shelter	12x28 MIEMSS CFG	75,000	
		Microwave	Easton to Denton	150,000	
					\$450,000
Carroll	2001	Tower – 270 ft.	Lineboro	\$180,000	
		Shelter	12x28 MIEMSS CFG	75,000	
		Microwave	Westminster to Lineboro	150,000	
		Microwave	Westminster to Carroll EOC	150,000	
		Microwave	Owings Mills to Westminster Tower	150,000	
		Microwave	Sinai to Owings Mills	150,000	
		Microwave	Westminster to SHA/MSP	150,000	
					\$1,005,000
Cecil	2001	Tower – 340	Rising Sun	\$225,000	
		Shelter	12x28 MIEMSS CFG	75,000	
		Microwave	RT – 155/95 to Rising Sun	150,000	
		Microwave	RT – 155/95 to Elk Neck	150,000	
		Microwave	Elk Neck to Elkton EOC	150,000	
					\$750,000

Attachment VI (cont.)

PROJECT DATA SHEET FOR FY-2001 PHASE - TWO					
County	Year	Type	Site	Estimated Cost	Totals
Charles	2001	Microwave	Prince Frederick to Hughesville	\$150,000	
		Microwave	Hughesville to La Plata	150,000	
		Microwave	La Plata to Nanjemoy	150,000	
		Microwave	La Plata to Morgantown	150,000	
		Microwave	La Plata to Bryans Road	150,000	
					\$750,000
Dorchester	2001	Microwave	Trappe to Bucktown Road	\$150,000	
		Microwave	Bucktown Road to Vienna	150,000	
					\$300,000
Frederick	2001	Tower 195 ft.	Marlu Ridge	\$175,000	
		Shelter	12x29 MIEMSS CFG	75,000	
		Microwave	CM6-8DS1	150,000	
		Microwave	Gambrills to Frederick EOC	150,000	
		Microwave	Mt. Airy to Gambrill Mt.	150,000	
					\$700,000
Garrett	2001	Tower - 195 ft.	High Rock	\$175,000	
		Shelter	12x28 MIEMSS CFG	75,000	
		Microwave	CM6-28DS1 to Thayerville	150,000	
		Microwave	Thayerville to Oakland	150,000	
		Microwave	Oakland to Oakland EOC	150,000	
		Microwave	Oakland to Eagle Rock	150,000	
					\$850,000
Harford	2001	Microwave	Madonna to Hickory	\$150,000	
		Microwave	Hickory to Stoney Forest	150,000	
		Microwave	Stoney Forest to RT 155/95	150,000	
		Microwave	Hickory to Whiteford	150,000	
		Microwave	Whiteford to Lapadum	150,000	
		Microwave	Stoney Forest to Joppa-Magnolia	150,000	
					\$900,000
Howard	2001	Tower - 340	Dayton SHA	\$225,000	
		Shelter	12x28 MIEMSS CFG	75,000	
		Microwave	Dayton to	150,000	
					\$450,000
Kent	2001	Microwave	Sudlersville to K/QA Hospital	\$150,000	
		Microwave	K/QA Hospital to Kent EOC	150,000	
		Microwave	Kent EOC to Coleman DNR	150,000	
					\$450,000
Prince Georges	2001	Tower - 340	Cedarville DNR	225,000.00	
		Shelter	12x28 MIEMSS CFG	75,000.00	
		Microwave	Dyson to Cedarville	180,000.00	
		Microwave	Cedarville to Prince Frederick	180,000.00	
					660,000.00

Attachment VI (cont.)

PROJECT DATA SHEET FOR FY-2001 PHASE - TWO					
County	Year	Type	Site	Estimated Cost	Totals
Somerset	2001	Tower - 340 ft	Chrisfield	225,000.00	
		Shelter	12x28 MIEMSS CFG	75,000.00	
		Microwave	CM6-12DS1 to Princess Anne	150,000.00	
					450,000.00
St. Mary's	2001	Microwave	Prince Frederick to Leonardtown	<u>\$160,000</u>	
					\$160,000
Washington	2001	Tower - 195 ft	Lambs Knoll	175,000.00	
		Shelter	12x28 MIEMSS CFG	75,000.00	
		Tower 180 ft	Hagerstown EOC	200,000.00	
		Microwave	Gambrill Mt to Lambs Knoll	150,000.00	
		Microwave	Lambs Knoll to Hagerstown	150,000.00	
		Microwave	Hagerstown to Fairview	150,000.00	
		Microwave	Fairview to Sideling	<u>150,000.00</u>	
					\$1,050,000
Wicomico	2001	Microwave	Salisbury to Pittsville	150,000.00	
		Microwave	Vienna to Poplar Hill	<u>150,000.00</u>	
					\$300,000
Worcester	2001	Tower - 340 ft	Newark	225,000.00	
Worcester	2001	Shelter	12x28 MIEMSS CFG	75,000.00	
Worcester	2001	Microwave	Nassawango to Newark	<u>150,000.00</u>	
					\$450,000
			FY 2001 Total (See Note 1)		\$12,530,000

Note 1: The total cost does not consider the savings incurred through the competitive procurement process. It is anticipated that if all of the above projects are procured as a single project, savings of 10 to 15% could be expected.

Attachment VII

MEMORANDUM OF AGREEMENT

between

The State of Maryland, Department of Budget and Management (DBM), the Maryland Institute for Emergency Medical Services System (MIEMSS), the Maryland State Police (MSP), the Department of Natural Resources (DNR), the Department of Transportation (MDOT)..... (collectively, the State) and Talbot County, Maryland (Talbot) and Queen Anne's County, Maryland (Queen Anne) (collectively, the Counties) for the shared use of State and County communications facilities located in and around Queen Anne County, Maryland and Talbot County, Maryland.

The State and the Counties have been working to expand and upgrade the current communications systems of both the State and the Counties in and around the Queen Anne's and Talbot County areas. The State and the Counties have multiple existing communications systems located in this area. The existing systems are inadequate for independently supporting the communications requirements of the State and the Counties. The Counties are in the process of constructing a shared 800 MHz trunked communications system to address existing system inadequacies. A thorough search of the area has not found a reasonable alternative solution.

It would be in the best interests of the State and the Counties to share communications systems and to collocate equipment on shared facilities. Sharing communications systems that are built to support current and future State and County communications requirements will serve the public interest by minimizing costs, reducing the number of towers required, and minimizing the visual impact on the existing and future communities. Combining the existing systems and facilities will support future communications initiatives, reduce duplication of systems and services, reduce inventory and service costs, and will replace leased telephone lines with microwave equipment thereby reducing costs. Upgrading the existing facilities will support future State and County public safety projects and will replace leased telephone lines with microwave equipment, thereby reducing costs.

WYE MILLS SEGMENT

Queen Anne's and Talbot Counties are in the process of constructing a new 800 MHz trunked communications system. The project design requires a tower in the Wye Mills area that will serve as the communications hub site. The State has determined a need for improved radio coverage in this area. This site will serve as a node on the State microwave backbone system.

The State will construct a new 340 foot self-supporting tower on State Highway Administration (SHA) right of way. The State will provide a new 12 x 28 ft. communications equipment shelter with emergency generator for State equipment. The Counties will provide an additional communications equipment shelter without emergency generator for County use. The State will provide emergency power to the county shelter from the State emergency generator. This new structure will be used to support expanded operations including the County 800 MHZ antennas (proposed new public safety system), existing public safety communications systems, MIEMSS

6 GHZ microwave antennas (statewide medical communications system digital microwave backbone), and a future State communications system.

The Counties have agreed to expand the capacity of the microwave segment at County cost if the State provides the communications tower. In addition, the Counties will provide access to existing County towers at Sudlersville, Rt 18 – Park, Centreville EOC, and Easton for current and future State systems.

TRAPPE SEGMENT

Queen Anne's and Talbot Counties are in the process of constructing a new 800 MHz trunked communications system. The project design requires a tower in the Trappe, MD area that will serve as a spur site for the proposed system. The State has determined a need for improved communications system coverage in this area. This site will serve as a node on the State microwave backbone system.

The State will construct a new 340 foot self-supporting tower on State Highway Administration (SHA) right of way. The State will provide a new 12 x 28 ft. communications equipment shelter with emergency generator for State and County communications equipment. The SHA will utilize this new tower in lieu of constructing a new tower at the Cambridge SHA maintenance facility. This site will serve as a node on the State microwave backbone system. The Counties have agreed to expand the capacity of the microwave segment at County cost if the State provides the communications tower. In addition, the Counties will provide access to existing County towers at Sudlersville, Rt 18 – Park, Centreville EOC, and Easton for current and future State systems.

The county will provide the State with channel capacity on the Counties microwave communications system from Easton to Trappe.

SUDLERSVILLE SEGMENT

The County will permit the State to place its communications equipment on the tower and in the existing equipment building. The County will permit the State to reserve space for 700 MHz antennas on the tower and equipment in the equipment building. The County will retain control of the communications facilities. The State and the Counties will retain control, and be responsible for all maintenance, of their respective communications systems.

If necessary, the State will modify the site to accomplish the requirements necessary to accommodate State microwave radio equipment, other State radio equipment and to provide for future State and County communications system equipment. If required for State equipment, the State will install a new equipment building to house some of the existing and future communications system equipment.

RT. 18 – PARK SEGMENT

The County will permit the State to place its communications equipment on the tower and in the existing equipment building. The County will permit the State to reserve space for 700 MHz antennas on the tower and equipment in the equipment building. The County will retain control

of the communications facilities. The State and the Counties will retain control, and be responsible for all maintenance, of their respective communications systems.

If necessary, the State will modify the site to accomplish the requirements necessary to accommodate State microwave radio equipment, other State radio equipment and to provide for future State and County communications system equipment. If required for State equipment, the State will install a new equipment building to house some of the existing and future communications system equipment.

CENTREVILLE EOC SEGMENT

The County will permit the State to place its communications equipment on the tower and in the existing equipment building. The County will permit the State to reserve space for 700 MHz antennas on the tower and equipment in the equipment building. The County will retain control of the communications facilities. The State and the Counties will retain control, and be responsible for all maintenance, of their respective communications systems.

If necessary, the State will modify the site to accomplish the requirements necessary to accommodate State microwave radio equipment, other State radio equipment and to provide for future State and County communications system equipment. If required for State equipment, the State will install a new equipment building to house some of the existing and future communications system equipment.

EASTON SEGMENT

The County will permit the State to place its communications equipment on the tower and in the existing equipment building. The County will permit the State to reserve space for 700 MHz antennas on the tower and equipment in the equipment building. The County will retain control of the communications facilities. The State and the Counties will retain control, and be responsible for all maintenance, of their respective communications systems.

If necessary, the State will modify the site to accomplish the requirements necessary to accommodate State microwave radio equipment, other State radio equipment and to provide for future State and County communications system equipment. If required for State equipment, the State will install a new equipment building to house some of the existing and future communications system equipment.

This Agreement will remain in effect until such time that all of the respective parties mutually agree to rescind or terminate this Memorandum of Agreement.

ATTACHMENT VIII

PROPOSAL FOR AN INFRASTRUCTURE-BASED SYSTEM IN ST. MARY'S COUNTY

December 17, 1999

BACKGROUND

Interoperability has been an important issue with public safety radio communications for well over a decade. Catastrophes such as the Air Florida Flight 90 plan crash, Chase train wreck and Florida Wildfires all include poor communications between responding agencies as a hindrance to providing their best service.

Some improvement in the area of interoperability has taken place since the 1980's with mutual aid plans put in place and frequency sharing occurring in many places. It has typically been done between individual agencies on a local level as needed. No overall workable plan is in Maryland today.

As we complete the 1990's, the problem of interoperability is becoming more complex with the use of trunked radios systems not using the same protocol. In some cases sharing system keys where possible works, but there are still many agencies that use conventional radio channels or are incomparable with their neighbors.

DEFINITIONS

Interoperability is the ability of public Safety personnel to communicate by radio with other agencies, on demand and in real time. Public safety agencies require three distinct types of interoperability: *Day-to-Day*, *Mutual Aid* and *Task Force*.

Day to day interoperability involves coordination during routine public safety operations. Interoperability is required, for example, when firefighters from around a county join forces to battle fire or when neighboring law enforcement agencies must work together during a vehicular chase.

Mutual aid interoperability involves a joint and immediate response to catastrophic accidents or natural disasters and requires tactical communications among numerous groups of public safety personnel. An airplane crash, bombing, forest fire, earthquake and hurricanes are all examples of mutual aid events.

Task force interoperability involves local, state and federal agencies coming together for an extended period of time to address a public safety problem. Task forces lead the extended recovery operations for major disasters, provide security for major events and conduct operations in response to prolonged criminal activity.

INTEROPERABILITY METHODS

Direct Method

All radio users operate in the same frequency band and with common protocols. This can take place naturally with the agencies using compatible radio systems or purchasing radios on the others system for the purpose of interoperability. Some examples are:

Anne Arundel and Baltimore Counties each operate similar 800 MHz trunked radios. They are sharing system keys to allow radios from each other system to operate on the others. This results in very good interoperability among the agencies at little cost.

3. Maryland State Police has purchased 450 MHz portable radios that operate on the Harford County Sheriff's Department radio system. This method provides good interoperability, but requires an additional radio be used that only works in Harford County.

Indirect Method

Radio users operating on different operating systems and frequency bands demand on some form of an infrastructure to link one system to another. Typically, in the past this was done, using a "console patch" and was awkward at best, for the field units to use.

Using an audio switch and microwave circuits that are available today, it is believed that a very usable infrastructure-based method can be developed. This would allow each agency to operate in their own radio system, and link the different systems together as required.

PROPOSAL FOR FY 2001

Develop and implement a "user friendly" interoperability pilot project for fiscal year 2001. Such a system is not in place now within Maryland, while there are several examples of shared systems. Analyze information from the shared systems for effectiveness and costs.

Specifics of Infrastructure Based Pilot System.

The goal of this project is to allow each of these agencies to intercommunicate "on demand" in real time with each other in a smooth effective manner.

Design an infrastructure-based system to provide interoperability in St. Mary's County. St. Mary's County is an ideal candidate since they are in the early design stages of an 800 MHz trunked radio system and have an awareness of interoperability.

They are neighbors to an existing 800 MHz trunked radio system, federal agencies, state agencies (Maryland & Virginia) and another county that uses a conventional radio system. Such a system would provide an excellent test platform to interface with multiple agencies and radio systems.

Project Time line

- | | |
|---------|--|
| FY 2000 | Identify user agencies and gather operation requirements.
Design system operating requirements and prepare bid documents.
Develop operating conventions and protocols. |
| FY 2001 | Install system, test, tweak and begin operation.
Gather data from existing shared systems.
Estimated cost for this pilot project is \$225,000.00 ³ |
| FY 2002 | Operate system under real and exercise conditions.
Complete operational effectiveness by end of FY2002. |
| FY 2003 | Compile the information gained from research results to create a work plan for the application of appropriate methods to provide and enhance interoperability between radio systems within Maryland. |

CONCLUSION

Interoperability is not a one size fits all, it is expected that no one method is right for all cases. Knowing that the right solution is dependent on operational, technical and budget constraints. Having this base data from the proposed St. Mary's County project, will allow the application of real world knowledge in Maryland's desire to improve public safety communications.

³

\$100,000 (audio switch) + \$125,000 (five base stations at five sites) = \$225,000